200Mbps Powerline Ethernet Adapter RPLC-201

User Manual

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Package Contents

The following items should be found in your package:

- 2x Rosewill **RPLC-201** 200Mbps Powerline Fast Ethernet Adapters
- 2x RJ45 Ethernet Cables
- 1x Quick Installation Guide
- 1x Resource CD for **RPLC-201**, including:
  - Rosewill Powerline Utility
  - Quick Installation Guide
  - User Guide

Note:

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact with your distributor.

Chapter 1 Introduction to Hardware

Thank you for purchasing Rosewill's **RPLC-201** Homeplug AV compliant Powerline Adapter. The **RPLC-201** adapter can transmit data up to 200mbps via household's power outlet. **RPLC-201** can help you to establish a high-speed network that supports HD video, voice and data without wiring and drilling. It is suitable for using in a wide range of both residential (at home) and commercial (offices, apartments, hotels, warehouses) network applications.

1.1 Expanding your Network with RPLC-201

The RPLC-201 plugs into an power outlet to extend cable or DSL modem connection or your current Ethernet Network to almost any power outlet in your home with any new cabling.* Devices can securely communicate with each other via the 128-bit Advanced Encryption Standard (AES) through RPLC-201 at a high speed transfer rate of 200Mbps and at 10/100mbps LAN support.

☞ **Note:**

Powerline Technology has certain limitations.

1. The best performance for Powerline Data transmission will be under one power circuit
2. Performance may be decreased under different circuits but within one Electricity Meter due to the drop-off via hardware.

1.2 Key Features

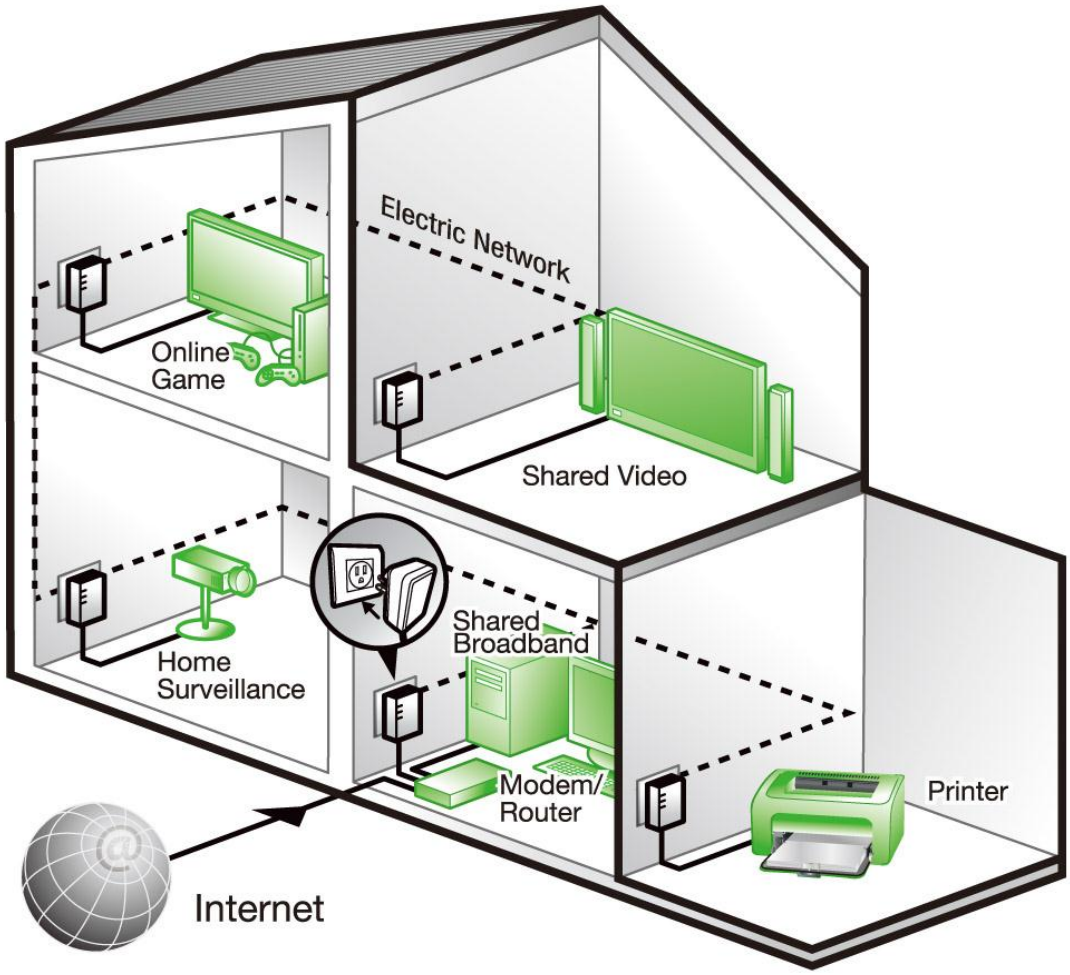
- **Plug and Play with Quick and Easy Installation**
  - Installation requires no new wiring
  - Every power socket becomes a connection node in the household. RPLC-201 supports connection for a total of 16 nodes.
  - Plug-and-play to your routers, computers and other network devices.
- **Enjoy Stable HD Videos and Gaming**
  - With a pair of plug-and-play RPLC-201 installed, you can easily extend your home network through any electrical outlet for Internet access by HDTVs, Blu-ray™ players, DVRs, PCs and game consoles.
- **QoS Management Enhances Streaming Quality**

- RPLC-201 supports a fixed 4-level type QoS and 8-level VLAN priority fields which automatically improves the streaming quality

- **Green Feature for Power saving mode**
  - RPLC-201 will detect signals when there is no signal transmit, it will automatically enters Power Saving mode which saves near 80% of the energy consumption.

1.3 Application

- Shared broadband internet access
- Higher data rate broadband sharing for power line LAN
- Backbone for Wireless and Wireless Extender
- TV over IP (IPTV) and Voice over Internet Protocol (VoIP)
- High Definition (HD) and Standard Definition (SD) video distribution
- Video surveillance
- Online Gaming



1.4 System Requirement

- If need to use Powerline Utility: Operating system: Windows 98SE, 2000, ME, XP 32/64 bit, Vista 32/64bit, and Win7 32/64 bit otherwise, no OS require
- CPU: Intel Pentium III or better, clock rate faster than 2.0GHz recommended
- RAM: At least 128MB
- Screen resolution: Any resolution
- Free disk space: At least 20MB
- Network interface: At least one Fast Ethernet (100 Mbps) network card, and a Ethernet Cable

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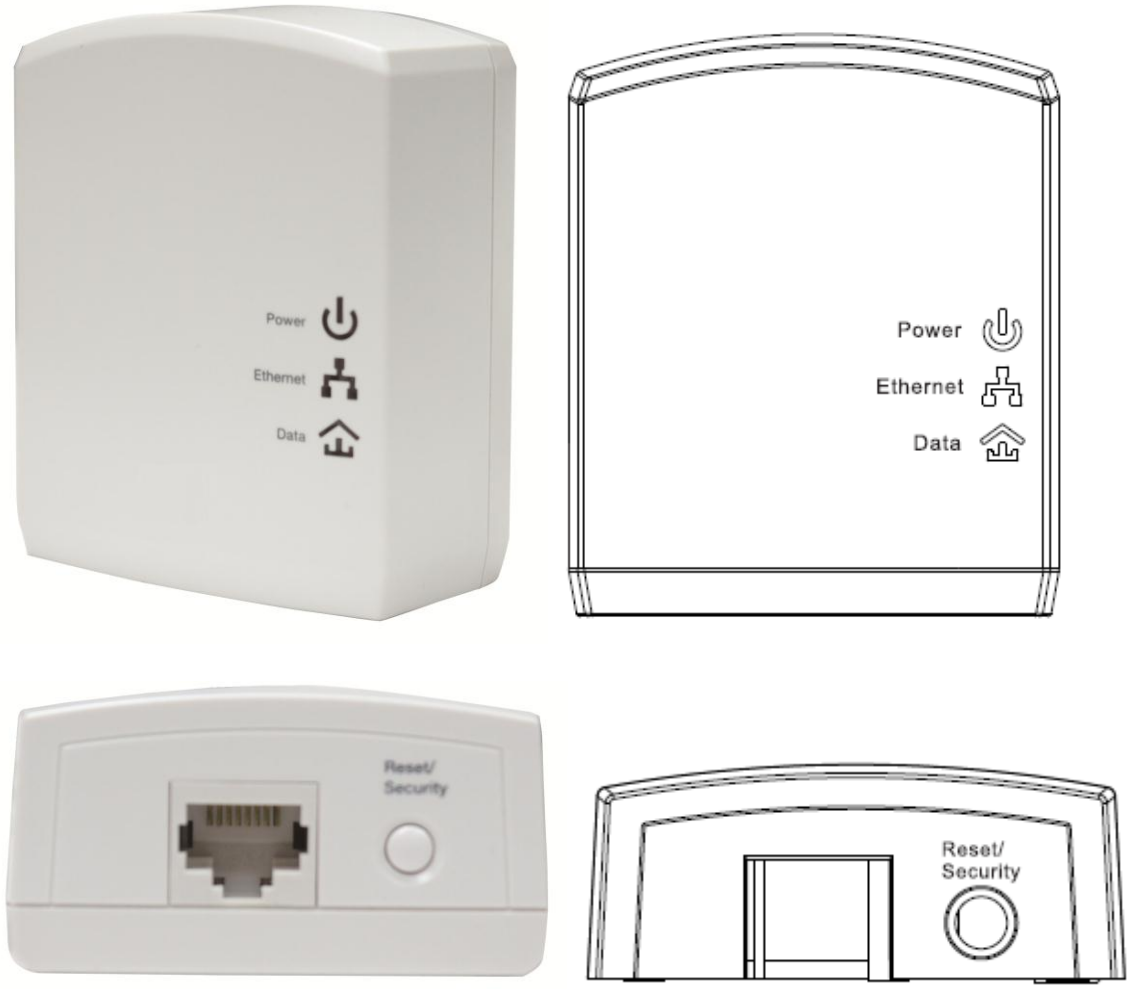
1.5 Hardware Diagram of RPLC-201



1.5.1 LED

LED	Color	Behavior	Description
(Power)	Green	On	System runs normally.
	Green	Blink	● System is resetting. ● System is in the process of password synchronization. ● System is in Power Saving mode
	-	Off	The PLC adapter is powered off.
(Ethernet)	Green	On	Ethernet connection has established.
		Blink	Data is being transmitted.
	-	Off	No Ethernet connection.

(Data)	Green/Orange/Red	On	The PLC adapter has connected to the powerline network. The Data LED color may vary according to the Data Transmit Quality. Green: Data Transmit Quality Excellent Orange: Data Transmit Quality Average Red: Data Transmit Quality Poor
	-	Off	The PLC adapter does not connect to the powerline network.

1.5.2 Powerline Adapter's Button and Connector

Reset/Security:

Reset: Pressing and holding the Button for between 10 seconds and 15 seconds makes the adapter restore the factory default settings.

Security: Pressing and holding the button for less than 3 seconds makes the adapter a member of the existing Powerline Network.

Ethernet Port (RJ45 Port): The Ethernet port connects to an Ethernet network cable. The other end of the cable connects to your computer or other Ethernet-enabled network device.

Connecting to the router/modem: Insert One end of the RJ45 Cable (Recommend using **Cat 5E** cable or above for Gigabit Network environment) to this port, and the other end to the router or modem. Then plug into the electrical outlet.

Connecting to PC / Smart TV / NB / Blu-ray Player / Media Player / IP Phone: Insert One end of the RJ45 Cable (Recommend using Cat 5E cable or above) to this port, and the other end to the other devices. Then plug into the electrical outlet.

Chapter 2 Introduction to Utility

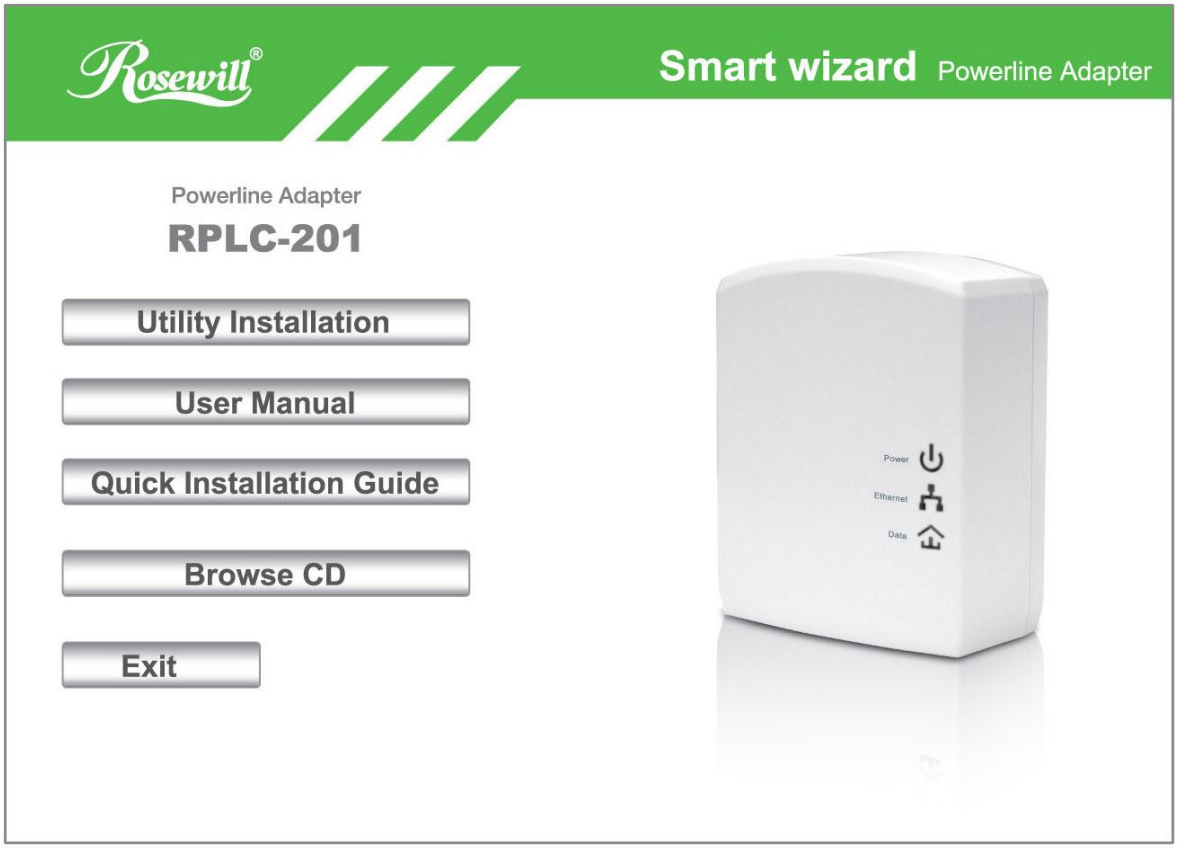
☞ Note:

Before installing the PLC utility software, make sure that there is no any other powerline utility installed on your computer. If there is another utility installed, please uninstall it and restart your computer.

2.1 Utility Installation

Please follow the steps below to install the utility.

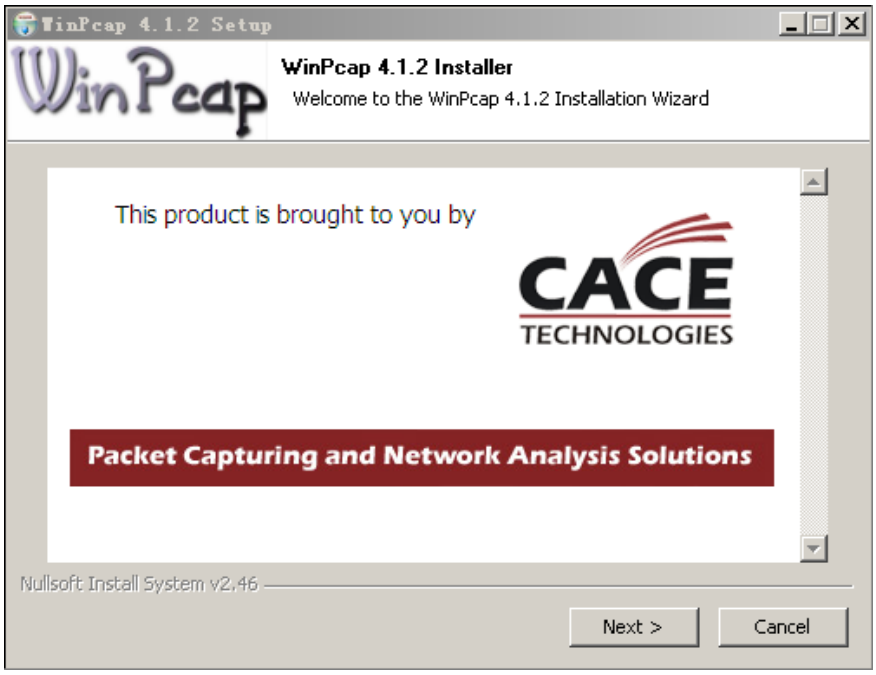
1. Please insert the utility CD into the computer's CD-ROM drive. Select and click "**Utility Installation**" in the Wizard Page.



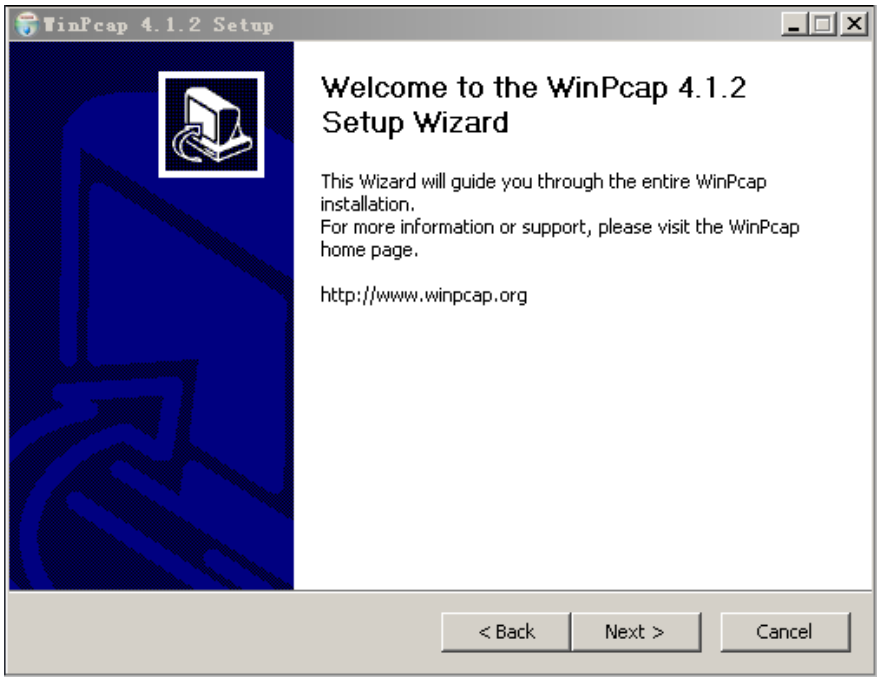
2. There will be 2 applications install into your system, WinPcap.exe and Powerline Utiltiy.exe. If your computer has not been installed with WinPcap, WinPcap will automatically be installed first. Click **OK** to start install WinPcap.

If your computer has been installed with the latest WinPcap, Powerline Utility will be installed directly. Proceed to **step 11**.

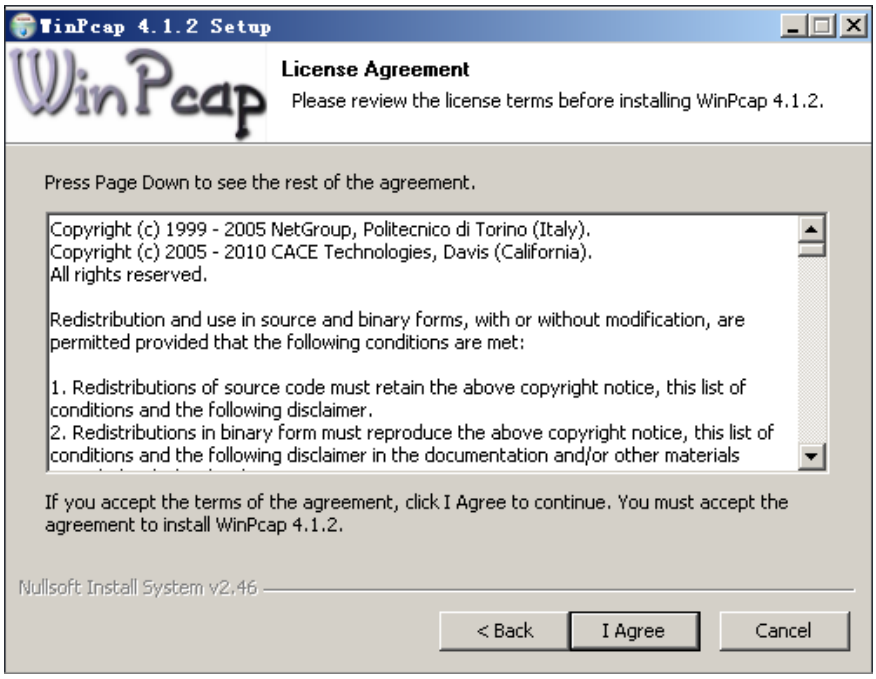
3. Click **Next** to continue installation.



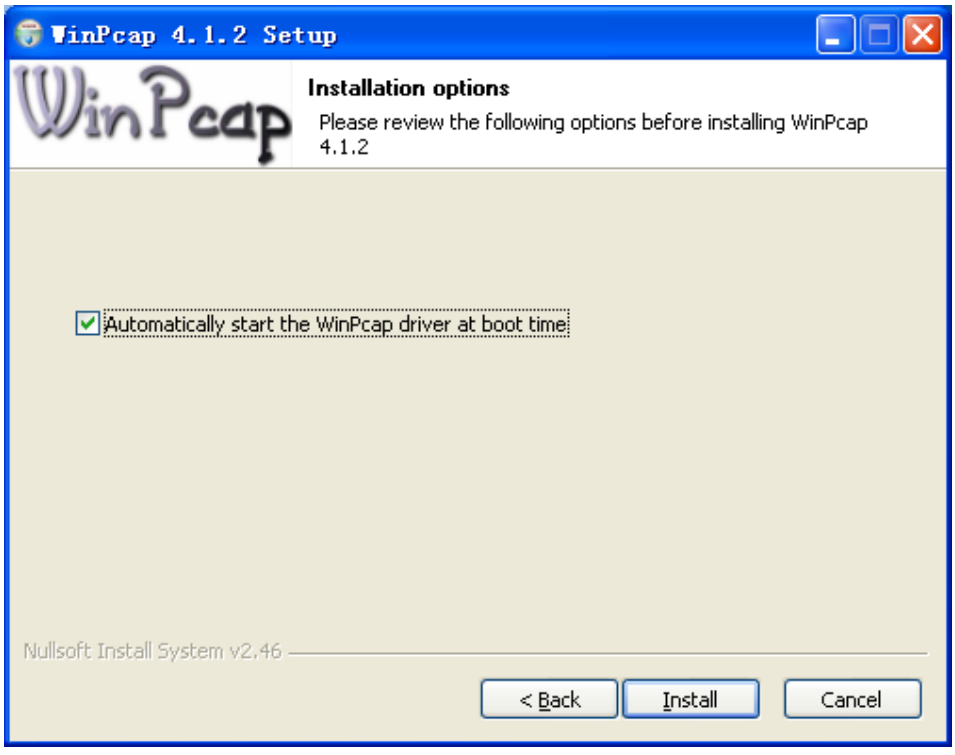
4. Click **Next** to continue installation.



5. Click **I Agree** to accept the license agreement of WinPcap.



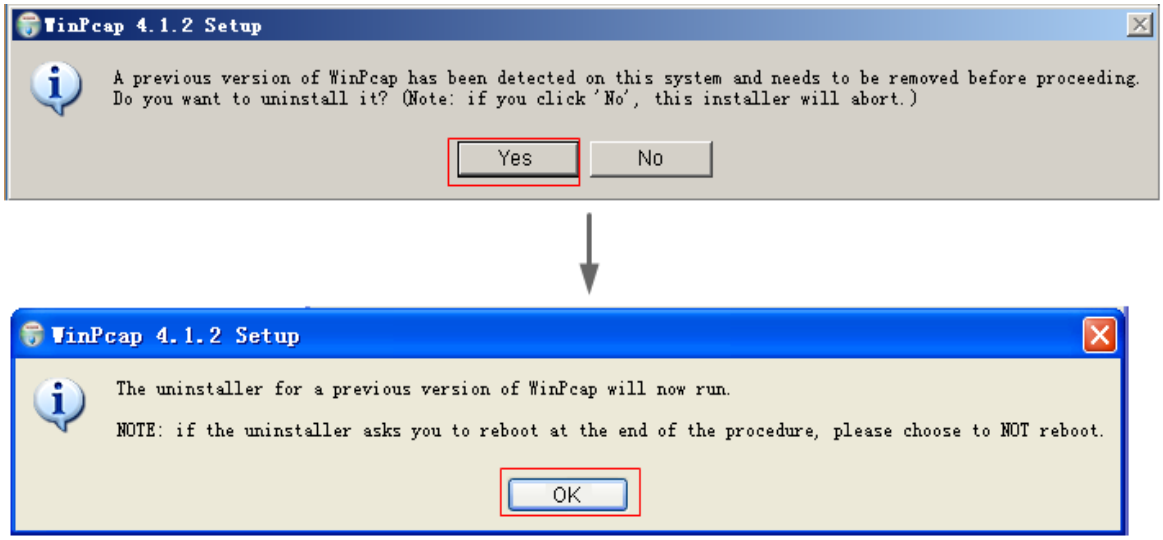
6. Click **Install** to install WinPcap 4.1.2.



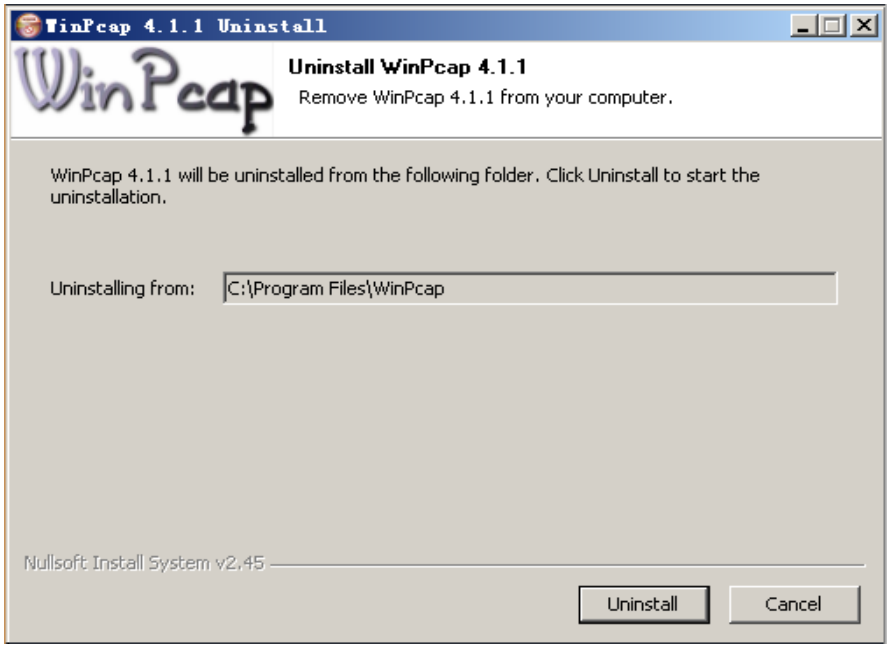
🕮 **Note:**

If WinPcap of an earlier version has been installed in your computer, the system notifies you to uninstall the earlier version when you try installing WinPcap included in the CD.

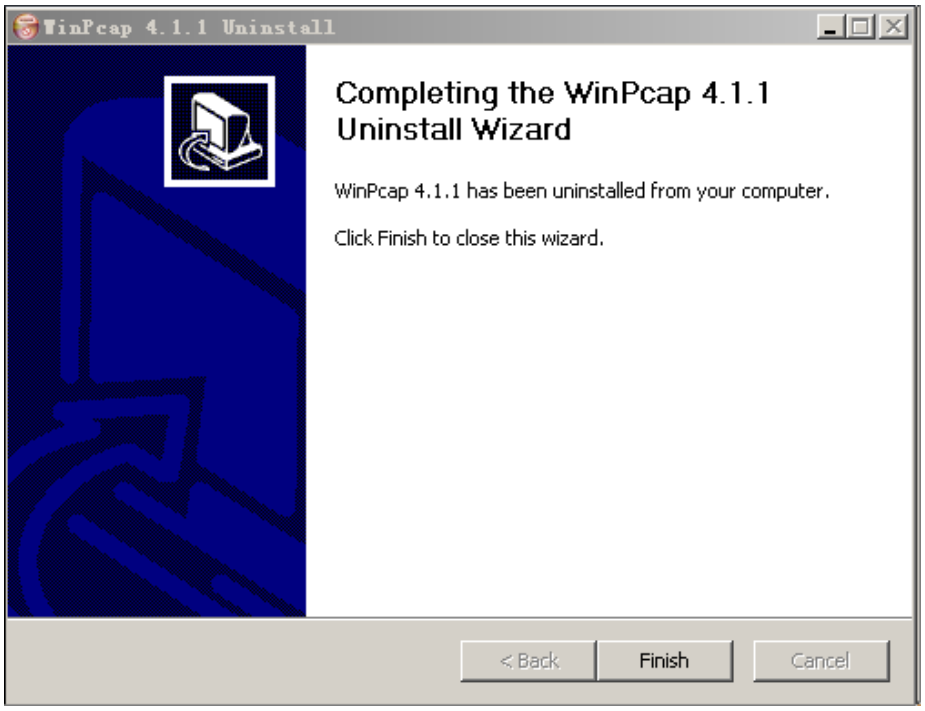
7. If WinPcap of an earlier version has been installed in your computer, the system notifies you to uninstall the earlier version when you try installing WinPcap included in the CD. Click **Yes**.



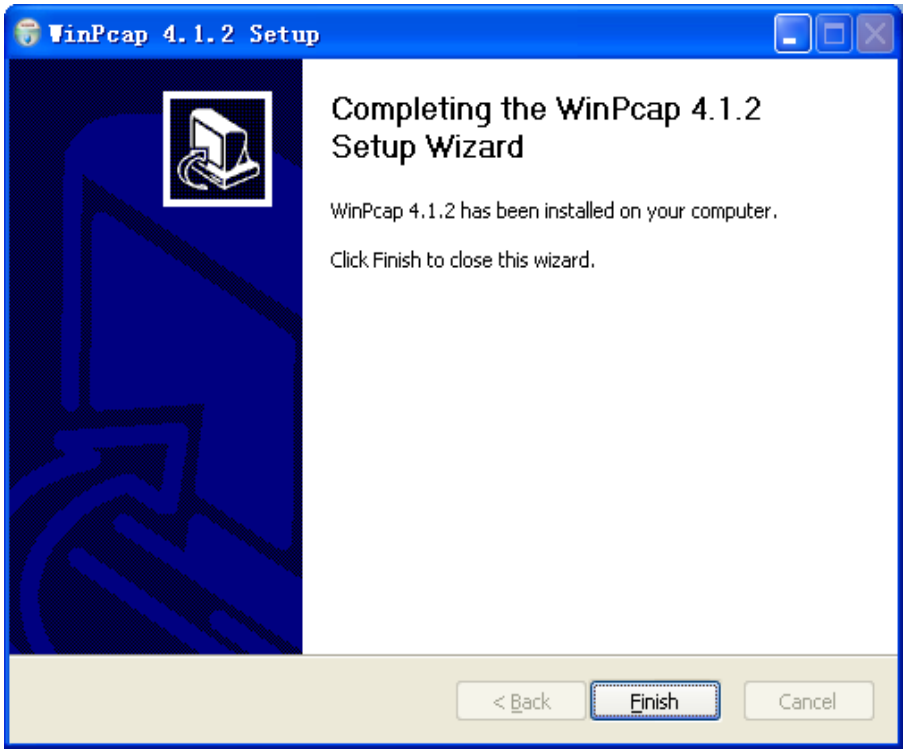
8. Click **Uninstall** to start uninstallation.



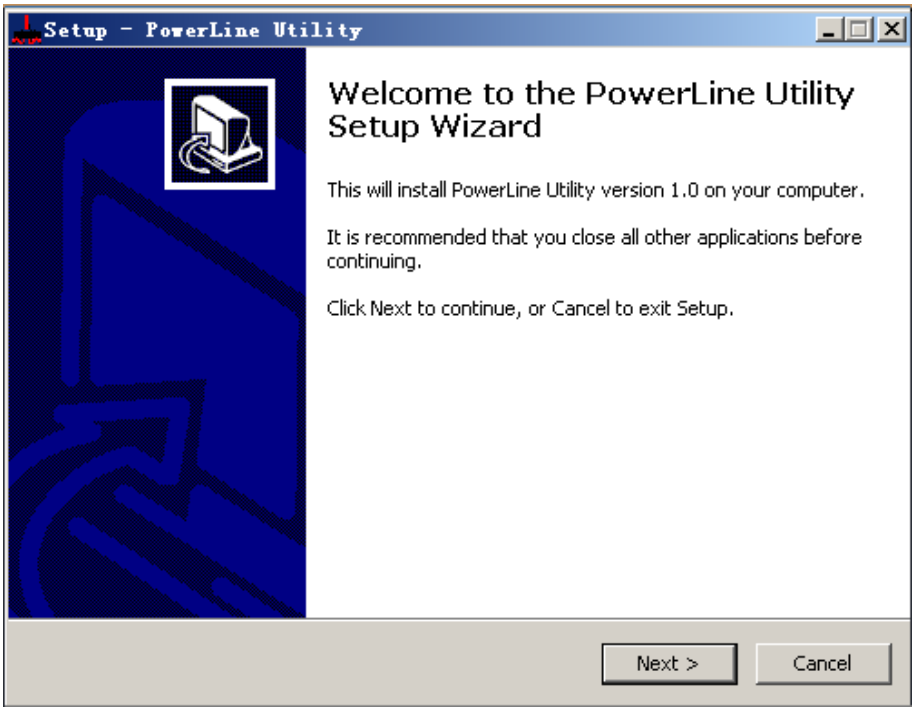
9. Click **Finish** to complete uninstalling earlier WinPcap.



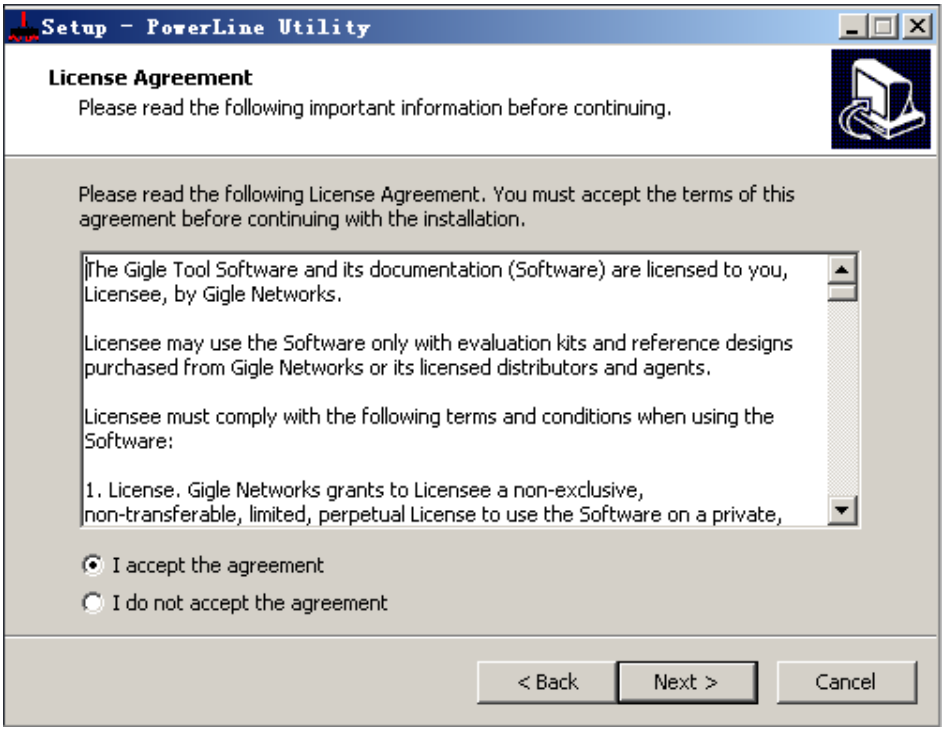
10. Click **Finish** to complete installing WinPcap and start to install Powerline Utility.



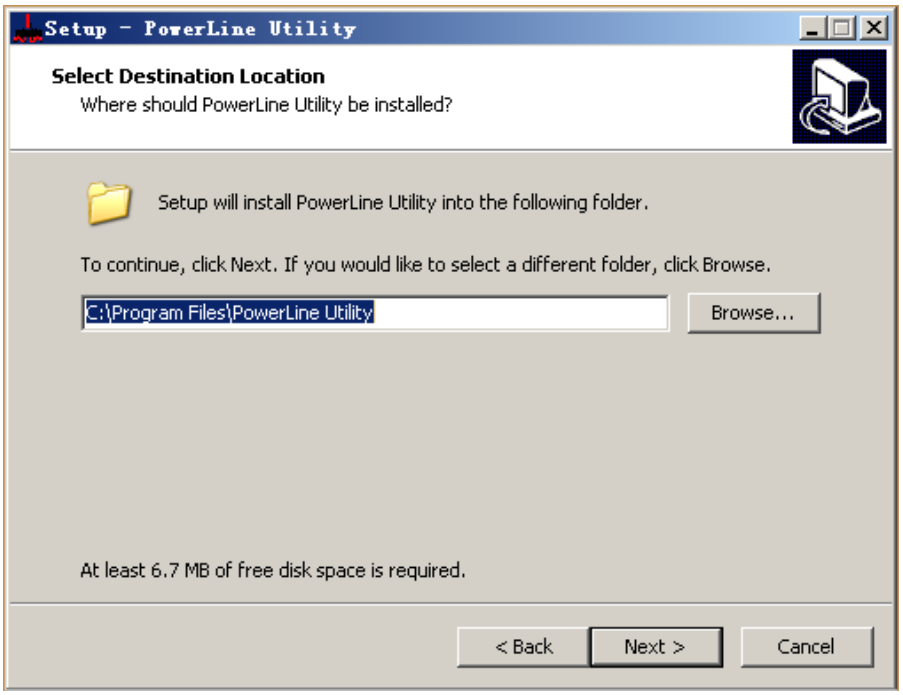
11. Click **Next** to follow Powerline Utility setup wizard.



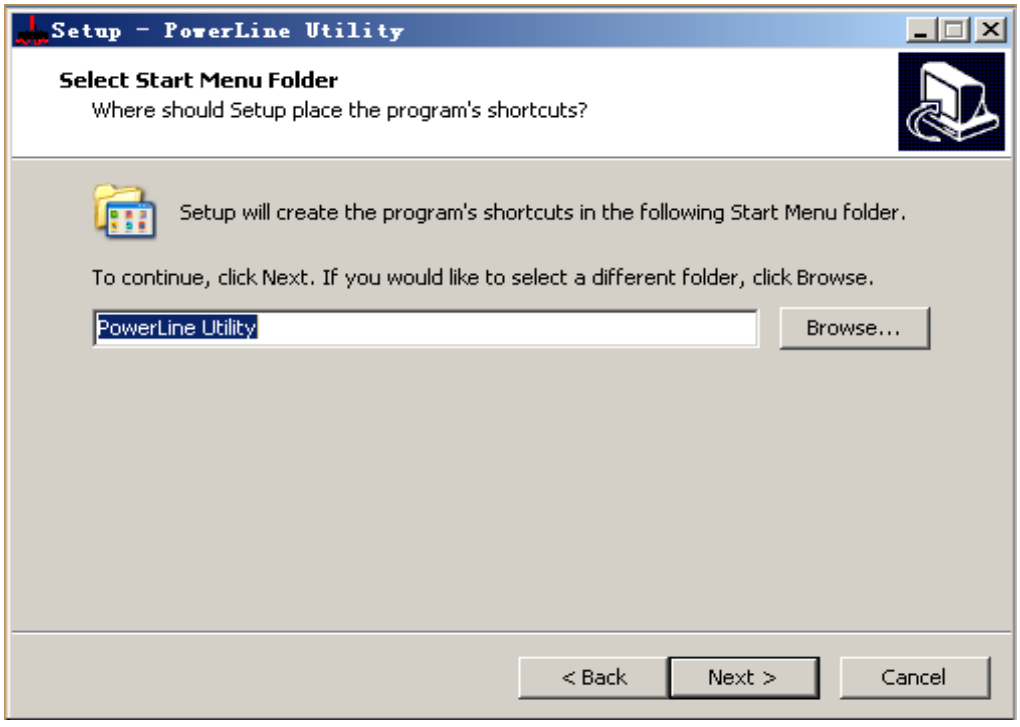
12. Select **I accept the agreement**. Click **Next** to continue installation.



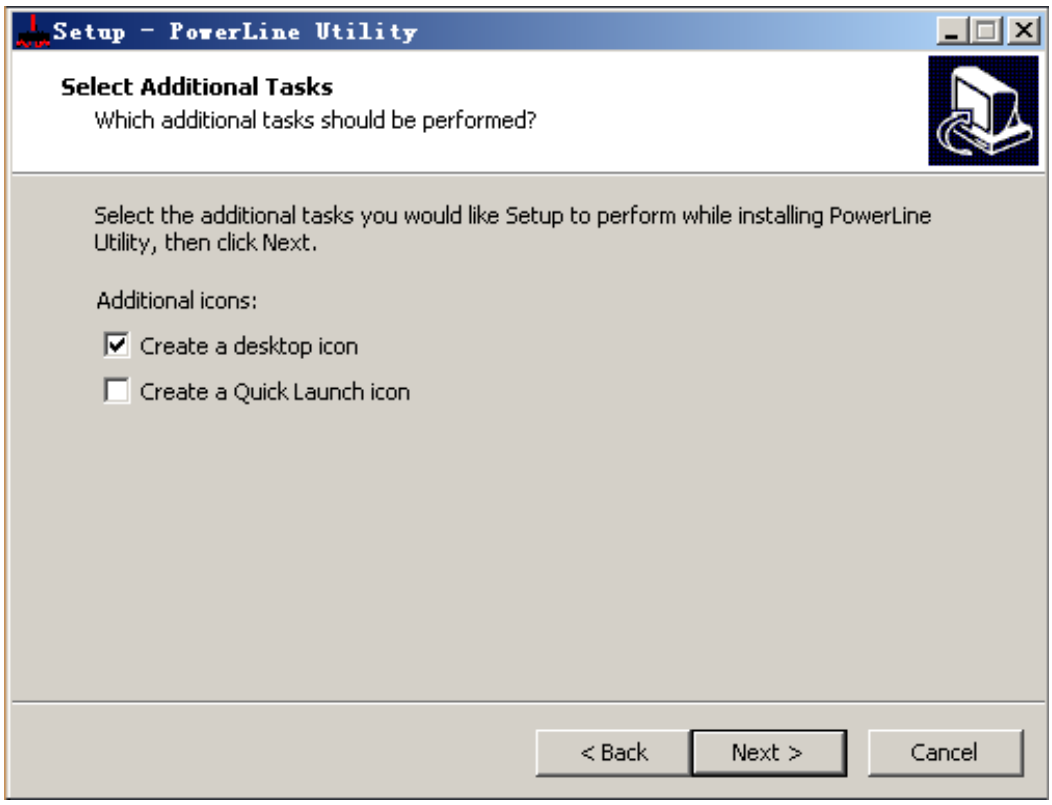
13. Click **Browse…** to change the path for installing Powerline Utility. The default installation path is **C:\Program Files\Powerline Utility**. Click Next.



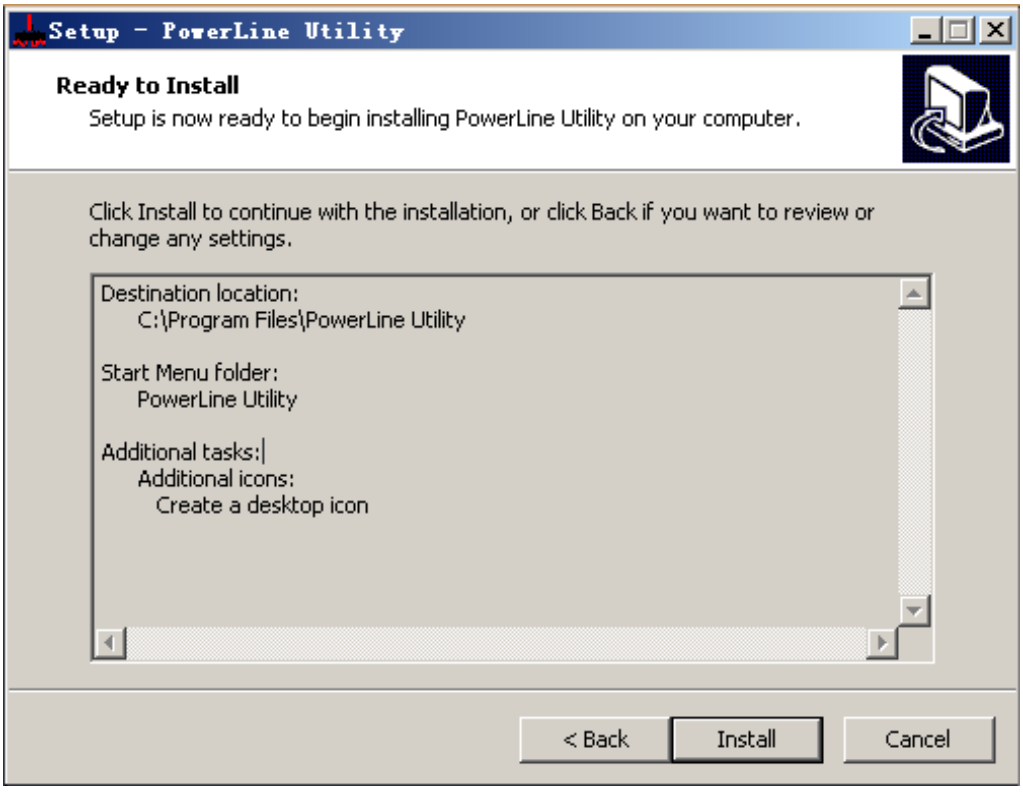
14. Create a shortcut in the Start Menu folder. Click **Browse…** to select a folder to place the shortcut. Click **Next** to continue the installation.



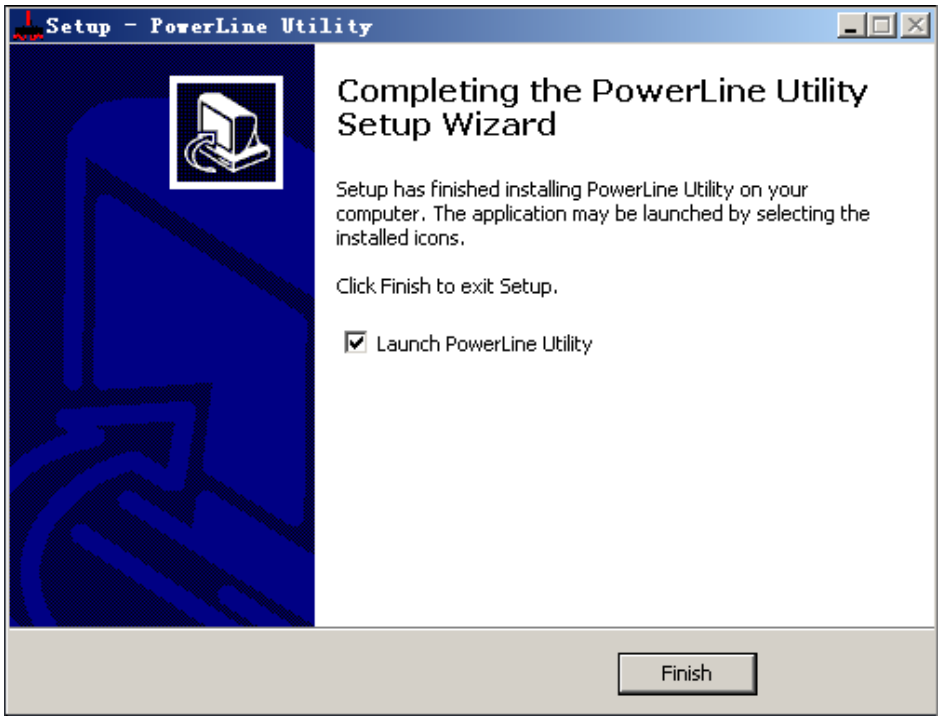
15. Select **Create a desktop icon** or **Create a Quick Launch icon** if necessary. Click **Next**.



16. Click **Install** to start installing Powerline Utility.



17. Click **Finish** to complete installing Powerline Utility. If you **select Launch Powerline Utility**, Powerline Utility is automatically run after it is successfully installed.



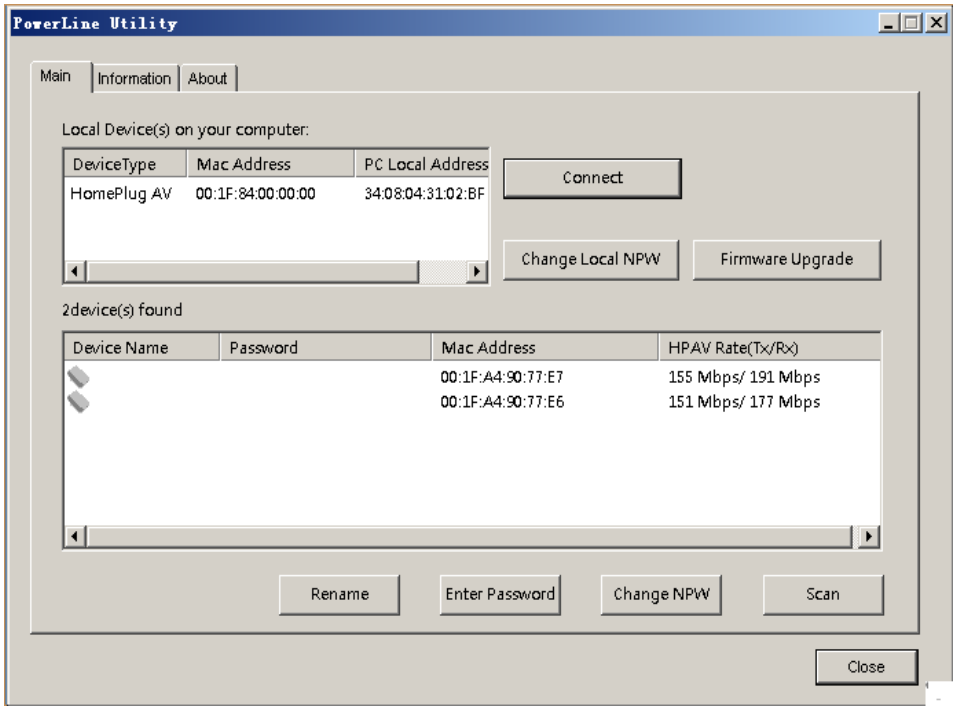
2.2 How to Use Powerline Utility

Click the icon in the desktop or quick launch bar to open Powerline Utility.

2.2.1 Main Tab

The Main screen provides a list of all powerline devices logically connected to the computer. The top panel shows the local HomePlugAV devices connected to the network interface card (NIC) of the computer or remote devices that pass verification.

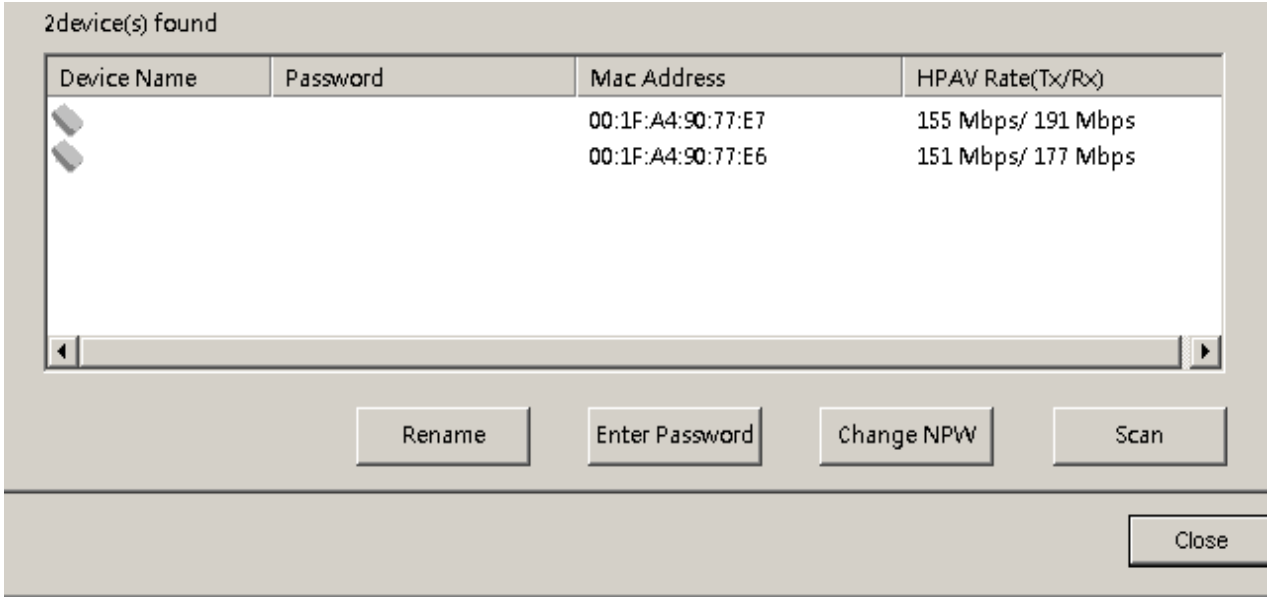
Click **Connect**, and Powerline Utility automatically scans the powerline periodically for other HomePlugAV devices connected to it. If no local HomePlugAV device is discovered, the screen displays "0 device(s) found".



Note:

Usually, only one HomePlugAV device will be detected and displayed on the top panel of the screen. However, more than one HomePlugAV devices will be detected if your computer has multiple NICs.

The lower panel displays all the HomePlugAV remote devices discovered in the current logical network. The total number of remoter devices connected in the same network is displayed above the remote device panel.



The following information is displayed for all the devices that appear in the lower panel.

Device Name

This column shows the default device name, which may be modified. To change the name, click **Rename**.

Mac Address

This column shows the MAC addresses of the remote devices.

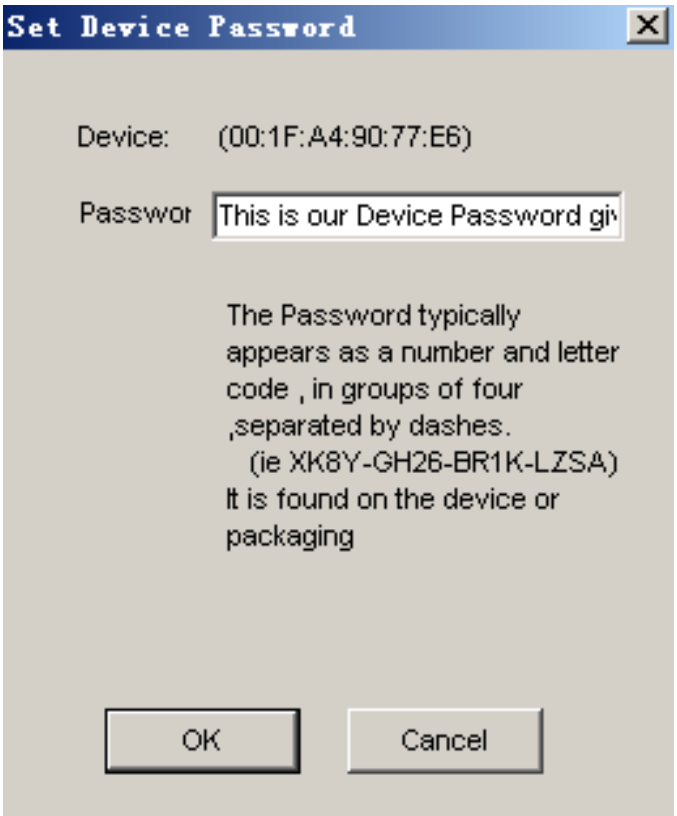
Password

By default, this column is blank. You can click **Enter Password** to enter it. For some operations (for example, changing network passwords), you must first get devices' password verified by entering correct passwords.

The steps for entering the password of the device are as follows:

Step 1 Click the device name to select the device in the lower panel.

Step 2 Click **Enter Password**. A dialog box appears, showing the device name and password. The default password (**DEK**) is printed on labels on the bottom of devices.



Step 3 Click **OK** to verify the password.

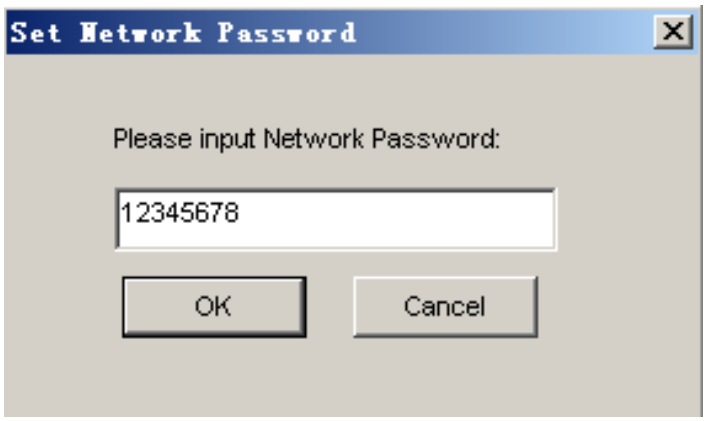
This process might take a few seconds to get completed. If the password is entered correctly, the device's password shows in the Password column on the lower panel. If a device is not found, a message appears, suggesting trying again.

Change NPW (Network Password)

The **Change NPW** button is used to remove a remote device from its existing network by changing the NPW for the remote device. All devices are shipped with a default NPW ("HomePlugAV"). Devices with the same NPW are located in the same network.

> 🕮 **Note:**
> Only devices that have their password verified can be removed from a network by clicking **Change NPW**. Before changing a device's NPW, click **Enter Password** to enter the device's password to achieve verification.

If the device is found and has its password entered correctly, enter a new NPW different from the existing network in the **Set Network Password** dialog box displayed. Then, the device is successfully removed from the network.



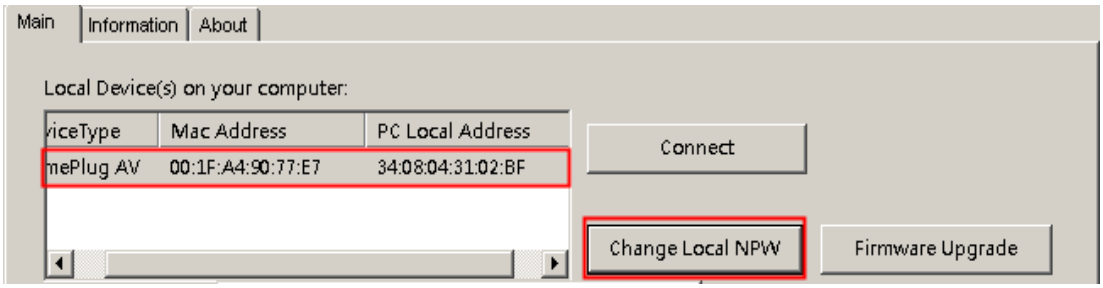
If a device does not have its password entered, a "Not change!" message appears. You need to click **Enter Password** to enter the device's password to achieve verification first.

Change Local NPW

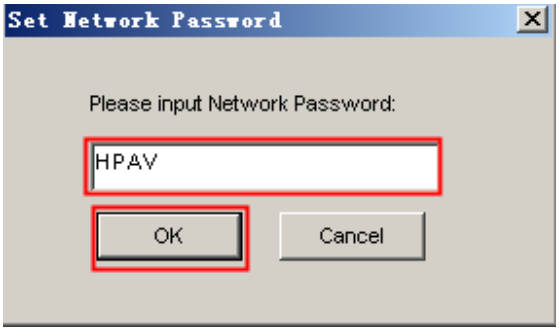
The **Change NPW** button is used to remove a local device from its existing network or add a local device to another network by changing the NPW for the local device. All devices are shipped with a default NPW ("HomePlugAV"). Devices with the same NPW are located in the same network.

To remove a local device from its existing network:

Step 1 Select a local device in the top panel and click **Change Local NPW**.



Step 2 In the screen displayed, set a network password different from that of the local device's existing network.



Step 3 Click **OK**.

After the network password for the local device is changed successfully, this local device is removed from its existing network. Previous devices displayed on the lower panel will disappear and devices with the same NPW as this local device will appear on the lower panel.

To add a local device into a network:

Step 1 Select a local device in the top panel and click **Change Local NPW**.

Step 2 In the screen displayed, set the network password the same as that of the network this device is to add into.

Step 3 Click **OK**.

After the network password for the local device is changed successfully, this local device is added into the target network. Previous devices displayed on the lower panel will disappear and devices in the target network will appear on the lower panel.

Scan

The **Scan** button is used to perform an immediate search for HomePlugAV devices connected to the powerline network. By default, Powerline Utility automatically scans every a few seconds and updates the displayed information.

Firmware Upgrade

The **Firmware Upgrade** button is used to upgrade the device firmware.

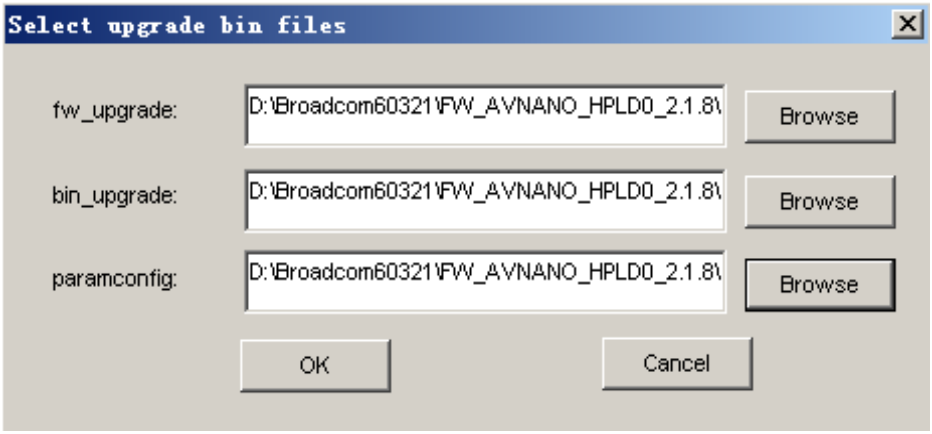
> 🕮 **Note:**
> Only devices that have their password verified can achieve firmware upgrade by clicking **Firmware Upgrade**.

The steps for upgrading firmware are as follows:

Step 1 Select a local device from the top panel.

Step 2 Click **Firmware Upgrade**.

Step 3 Click **Browse** to choose a configuration file (**fw_upgrade**, **bin-upgrade**, or **paramconfig**).



Step 4 Click **OK**.

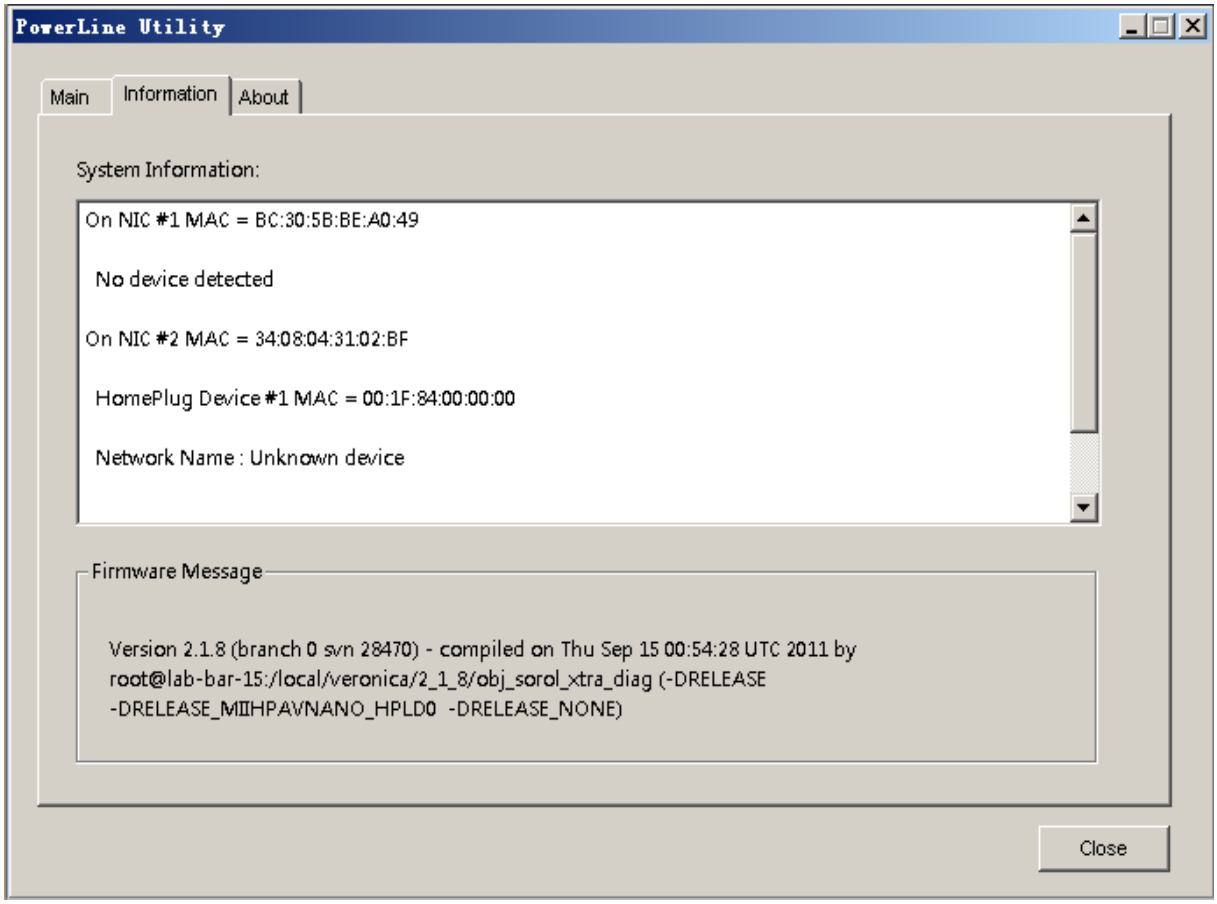
It takes several minutes to complete firmware upgrade. Do not interrupt the upgrade process.

2.2.2 Information Tab

The Information screen shows the system information and the firmware version.

The upper panel shows technical data concerning software and hardware on the host computer that are used to communicate through HomePlug on the powerline network. It includes the following:

- MAC address of all NICs connected to the host
- MAC address of all devices connected locally to the host
- network Name (NPW) of local devices
- Software version
- Firmware version (including release date and SVN date)
- Vendor name



2.2.3 About Tab

The **About** screen shows the software version and provides an html link to our website. Clicking the Web address, you can visit the website.

2.2.4 Preferences

The lower panel displays options for turning the autoscan function on or off.

Chapter 3 How to Use the Security/Reset Pushbutton

This chapter describes how to use the **Security/Reset** pushbutton to add new devices into or remove devices from a HomePlug AV logical network (AVLN). You can monitor the operation progress and results by observing the Power LED status.

3.1 Forming a HomePlug AV logical network

Scenario:

Devices A and B with different NMK (Network Membership Key used to authenticate/access) values are connected to the same powerline. Users want to use them to form a logical network.

Forming a HomePlug AV logical network

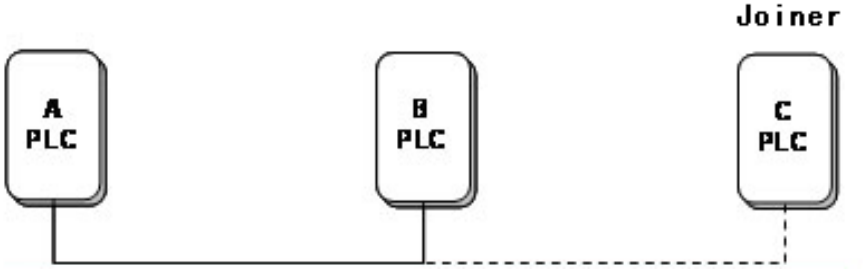
Do as follows to form a logical network:

1. Press the Security/Reset pushbutton on device A or B for 5-8 seconds. The device will reset and restart with a random NMK.
2. Press the Security/Reset button on device A for less than 3 seconds.
3. Within 30 seconds, press the Security/Reset button on device B for less than 3 seconds.
4. Wait for connection to complete.

The power indicator on both devices will flash evenly at 1 second intervals until the operation succeeds or fails. If the connection succeeds, the Power and Data indicators on both devices illuminate steadily. If the connection fails, the Power indicators on both devices keep steady on, but the Data indicators on both devices are off. In that case, repeat steps 1-4.

3.2 Joining a Network

Scenario:
Devices A and B are located in network N. Users want to add device C (the joiner) into network N. Any devices on network N can become the 'adder'.



Joining a network

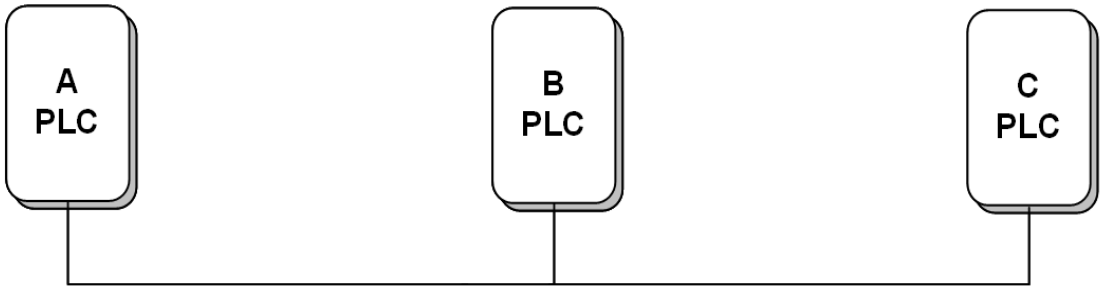
Please follow below to add Device C to Network N using the Security button:

1. Press the Security/Reset pushbutton on device C (the joiner) for 5-8 seconds. The device will reset and restart with a random NMK.
2. Press the Security/Reset button on device C (the 'joiner') for less than 3 seconds.
3. Within 30 seconds, press the Security/Reset button on device A (or device B) for less than 3 seconds.
4. Wait for connection to complete.

The power indicator on both devices will flash evenly at 1 second intervals until the operation succeeds or fails. If the connection succeeds, the Power and Data indicators on both devices illuminate steadily. If the connection fails, the Power indicators on both devices keep steady on, but the Data indicators on both devices are off. In that case, repeat steps 1-4.

3.2 Leaving a Network

Scenario:
Device C is located in a network. Users want to remove device C (the 'leaver') from its network.



Leaving a network

1. Press the **Security/Reset** pushbutton on device C (the 'leaver') for 5-8 seconds. The device will reset and restart with a random NMK.
2. Wait for reset to complete.

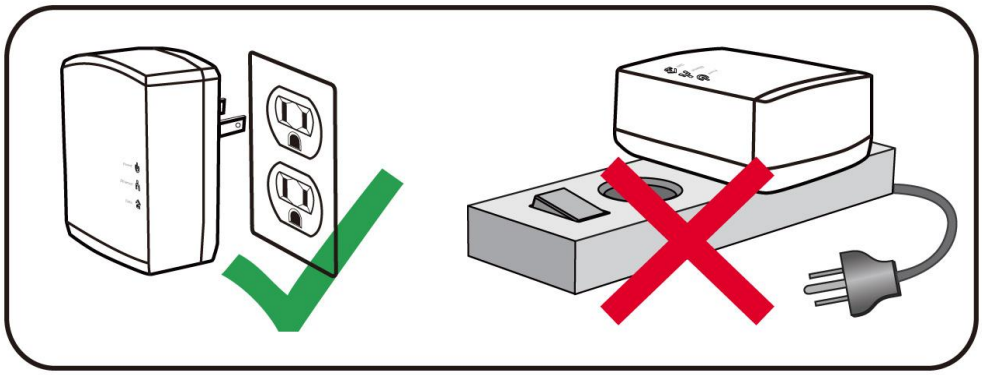
The Power indicator on device C momentarily extinguishes during reset, blinks during restart, and then illuminates steadily.

After device C is removed from its existing network, users can disconnect the device from the medium or join it to another logical network on the same medium

Appendix A: Improving the Transmission Quality

It is important to use the PLC product complying with the following "rule of thumb", because it can significantly improve the transmission capacity of the network.

PLC device is recommended to plug the device directly into a wall socket, not to power stripe.



Appendix B: Specifications

Spec	
Chipset	Broadcom BCM60321
Standards	IEEE 1901 and HomePlug AV compliant Co-existence with HomePlug 1.0 Nodes IEEE802.3, IEEE802.3u
Encryption	128-bit AES Encryption
Ports	10/100Mbps Ethernet port
LEDs	Power, Ethernet, Data
Powerline Speeds	Up to 200Mbps
Powerline Range	Up to 300 meters over Electricity line
Maximum PLC support	Capable of extending up to total of 8 Powerline adapters in one environment
Connection Type	RJ45
Connection Speeds	10/100M
Kit Type	Double
Frequency Band	2 MHz ~ 28 MHz
Power Consumption	<2.5 W Operation Mode 1.21 W Idle Mode 0.48 W Standby Mode (enter standby mode after 30 mins without data transmit detected)
QoS Support	Fixed Quality of Service (QoS) enhances media streaming quality: - ToS, Support up to 4-level type QoS, Support up to 8-level VLAN priority field - IGMP snooping for multicast to multiple unicast mapping - QoS Priority: - 1st: Network Management Frames and Voice

	- 2nd: HD Video and Music Streaming - 3rd: Data Streaming
System Requirement	Deployment requirements: Devices with 10/100 or 10/100/1000 Mbps Ethernet port Operates system not require. Utility software OS support: Microsoft Windows 2000/XP/Vista/7
Dimensions	2.72 x 2.28 x 1.22 in (69 x 58 x 31 mm) (1 Powerline adapter)
Weight	0.18 lbs. (80 g) (1 Powerline adapter)
Temperature	0°C ~ 40°C
Humidity	10% ~ 90% Non-condensing

Appendix C: Acronyms and Abbreviations

AVLN	AV In-home Logical Network, the AVLAN is the set of STAs that possess the same network membership key. Every AVLN is managed by a single CCo.
CCo	Central Coordinator
CSMA/CA	Carrier Sense Multiple Access / Collision Avoidance
DAK	Device Access Key
DM	Device Manager
IGMP	Internet Group Management Protocol
NEK	Network Encryption Key
NID	Network ID (Identification)
NMK	Network Membership Key
PLC	Powerline Communication
PIB	Parameter Information Block
STA	Station, a STA in the network with a connection to the powerline and being able to source or sink traffic
TDMA	Time Division Multiple Access
TEI	Terminal Equipment Identifier
TOS	Type Of Service
VLAN	Virtual Local Area Network

Appendix D: RPLC-201 QoS Support

RPLC-201 allows for 4 levels of Channel Access Priority (CAP (0 – 3)). The 8 levels of VLAN Ethernet tags must be mapped to the 4 levels of CAP priority, where CAP 3 is the highest priority and CAP 0 is the lowest. CAP 3 priority might be used for voice and network management frames, and CAP 2 is used for streaming HD video and music while CAP 1 and CAP 0 are used for data.

Default CAP

The 'Default CAP' group allows for default priority mapping of packets that do not have a VLAN TAG. The settings are available for Unicast (directed to a host).

- Unicast - (default CAP 1) - sets the default channel access priority for unicast frames not matching any other classification or mapping.
- IGMP managed Multicast Stream (Fixed to CAP 2) - sets the default channel access priority for stream data belonging to a snooped IGMP multicast group.
- IGMP - (default CAP 3) - sets the channel access priority for IGMP frames - these are the group management frames, not the stream data.
- Multicast/Broadcast - sets the default CAP for multicast frames not in a snooped group and for broadcast frames.

The following are the factory fixed settings for QoS Priority:

- 1st: Network Management Frames and Voice
- 2nd: Video and Music Streaming
- 3rd: Data Streaming

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Safety Warning

This device is intended for connection to the AC powerline. For installation instructions, please refer to the installation section of this guide. The following precautions should be taken when using this product.

- Read all instructions before installing and operating this product.
- Follow all warnings and instructions marked on the product.
- Unplug the device from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.
- Do not operate this product near water.
- This product should never be placed near or over a radiator or heat register.
- Do not use an extension cord between the device and the AC power source.
- Only a qualified technician should service this product. Opening or removing covers may result in exposure to dangerous voltage points or other risks.
- Do not plug the device into a power strip or surge protector because these devices may consist of filter and impair signal.
- Avoid plugging the device right next to noisy sources such as cell phone charger, Halogen light, noisy desktop computer, vacuum cleaner, etc. These cases result in poor transmission speed.
- Unplug the device from the wall outlet and refer the product to qualified service personnel for the following conditions:
  - If liquid has been spilled into the product
  - If the product has been exposed to rain or water
  - If the product does not operate normally when the operating instructions are followed
  - If the product exhibits a distinct change in performance

Your product is marked with this symbol, which is known as the WEEE mark. WEEE stands for Waste Electronics and Electrical Equipment. It means that used electrical and electronic products should not be mixed with general waste. Used electrical and electronic equipment should be treated separately.